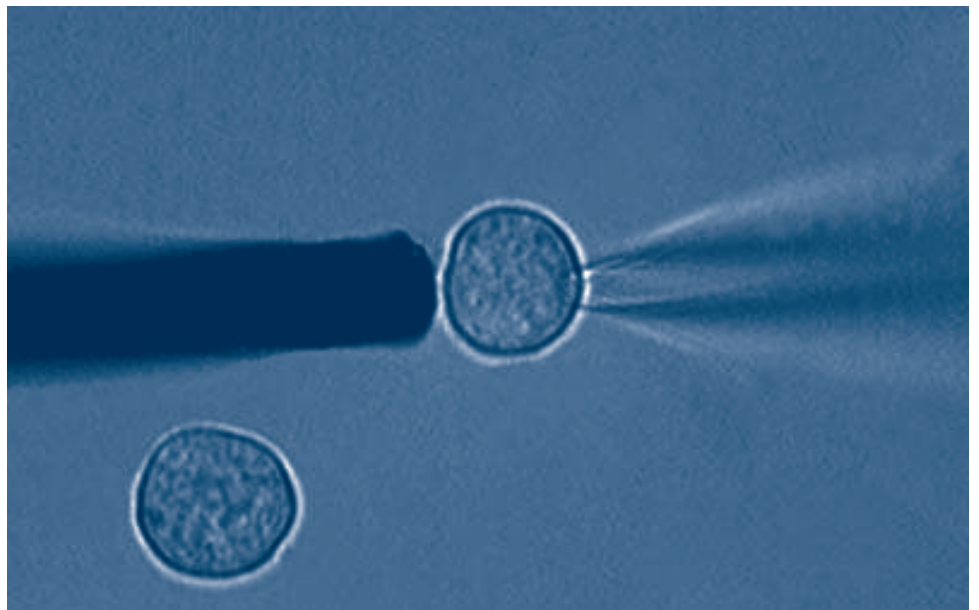




EVA 8

Voltammetric Amplifier



**If you believe your job is to
make new discoveries...**

**...discover EVA 8 the
Voltammetric Amplifier for
microelectrode technology**

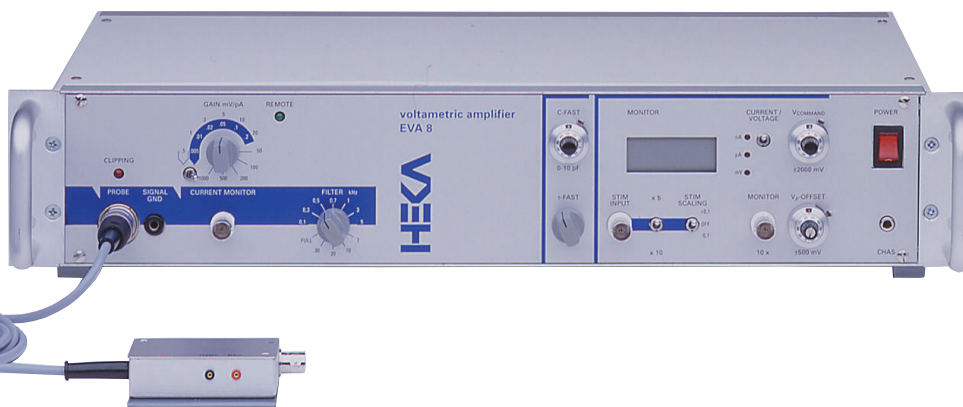
- Manual or Computer Control
- Capacitance Compensation
- Current Sensitivity:
5 mV/nA to 1 V/pA
- +/- 2 Volt Command
Potential Range
- 17 Current Output Gain
Ranges
- 7-Pole Bessel Filter
adjustable from 0.1 - 30 kHz
in 11 steps

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Voltammetric Amplifier

Jaroslav Heyrovsky first developed the voltammetry technique from the discovery of polarography in 1922. With significant advances in theory, methodology, instrumentation and electronic, the technique is now well



established and a standard method in many electrochemical and electrophysiological labs.

The EVA 8 is a Voltammetric Amplifier, designed for voltage clamp/potentiostatic measurements of currents with carbon fiber or other microelectrodes. Voltammetry is an electrochemical method, where a current-voltage relationship is used for qualitative and quantitative analysis of solvents in a sample.

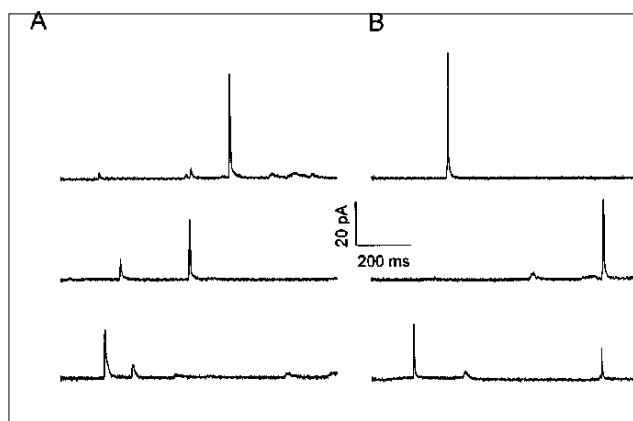
A typical application is the investigation of exocytosis processes, e.g. secretion of transmitters or hormones, and the measurement of extracellular concentrations of neurotransmitters (e.g. dopamine, noradrenaline, serotonin).

A positive electrode potential guarantees oxidation of the transmitter by the electrode. While the potential is kept constant, an increase of the local transmitter concentration induces a small increase of the measured outward current. This outward current is caused by the release of electrodes from the transmitter to the carbon fiber electrode. The time resolution of this method is usually below 1 ms. It can be used to detect the release of single vesicles from secreting cells.

The internal design of the EVA 8 is based on the well proven EPC 8 Patch Clamp Amplifier and provides the same high hardware quality and similar features.

Technically, the EVA 8 is noteworthy for three special features: the range-changing capability of the head stage, the extremely wide bandwidth available from the current monitor circuitry, and the computer control possibility. Together these features allow that a single headstage suffices for use with different sized electrodes to allow for a wide range of current measurement.

The versatility of the EVA 8 can best be appreciated by the variety of experiments that can be carried out with them. Besides high-resolution recordings of ion concentration this unit can be used in studies of quantitative determination of organic and inorganic compounds, determination of electron transfer and reaction mechanism, studies of oxidation and reduction processes.



Amperometric spikes in two populations (A, B) of chromaffin cells. MPI for Biophysical Chemistry, Göttingen, Germany.

Technical specifications

EVA 8 Main Unit

Dimensions (D x W x H):

(25.0 x 48.3 x 9.0) cm,
(9.8 x 19.0 x 3.5) inch

Weight:

7.6 kg / 16.5 lbs

Mounts in 19" rack.

Operates on standard

110 V / 230 V

EVA 8 Headstage

Dimensions (D x W x H):

(70 x 40 x 19) mm,
(2.75 x 1.57 x 0.75) inch

The input circuitry is contained in a hybrid integrated circuit.

Current measuring resistors:

50 G Ω (high range)

500 M Ω (medium range)

5 M Ω (low range)

Largest measurable currents:

200 pA (50 G Ω range)

20 nA (500 M Ω range)

2 μ A (5 M Ω range)

Input connector:

Standard BNC

Other connections:

Ground sense input

Electrode command voltage

Filters

The current monitor signal of the EVA 8 is filtered by a 7-pole Bessel filter adjustable from 0.1 to 30 kHz in 11 steps. In the additional 'FULL' setting, a 3-pole Bessel filter is used and the current monitor signal is provided at the full bandwidth of the EVA 8.

Capacitance Compensation

Fast capacitance cancellation:

0 to 10 pF, calibrated

0.5 to 5 μ s time constant

Electrode Offset

Adjustment of the electrode offset using a 10-turn dial with a range of \pm 500 mV

Command Potential

Internal:

Adjustment of positive or negative potential via 10-turn dial, 200 mV per turn, for a maximum range of \pm 2 V.

External:

Maximum input of \pm 10 V via front panel BNC.

100 mV/V or 200 mV/V selectable scaling factor provides a maximum command potential of \pm 1 V or \pm 2 V.

Display

3 1/2 digit LCD panel meter for display of the current or command potential.

Current Monitor Signal

Gain:

0.005 mV/pA to 1000 mV/pA

Bandwidth:

100 kHz (500 M Ω , 5 M Ω ranges)

60 kHz (50 G Ω range)

Computer Interface

Computer controlled operation via 2 x 16bit parallel output board or via LIH 1600 or ITC-18 data acquisition interface (see also data sheet "Recommended Configurations")

Related Products

LIH 1600

High-resolution, low-noise scientific data acquisition system.

PATCHMASTER

Multi-channel data acquisition and analysis software.

POTPULSE

Electrochemistry data acquisition and analysis software for Windows or Mac OS.

PULSE/PULSEFIT

Data acquisition and analysis software

X-CHART

Software implemented chart recorder.

PIP 5

Temperature controlled micro pipette puller

MIM 4

Motorized 3-axis micromanipulator with video option

EPC 10

Fully computer controlled patch clamp amplifier with built-in interface board.

PG 310/390

Fully computer controlled potentiostat/galvanostat with a compliance voltage of \pm 20 V / \pm 90 V and a current of 2 A / 1 A.

PG 340

Bipontiosat/galvanostat for Ring/Disk measurements and SECM applications.

PG 410/490

Manually or remote controllable potentiostat/galvanostat with a maximal compliance voltage of \pm 20 V / \pm 90 V and a current of 2 A / 1 A.

PG 510/590

Manually or remote controllable potentiostat/galvanostat with a built-in scan generator for a maximal compliance voltage of \pm 20 V / \pm 90 V and a current of 2 A / 1 A.

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